



October 23, 2003

Clinician Public Health Advisory

Update 1: Toxic Syndrome for Ricin Poisoning and Ricin & Abrin Case Definition

The South Carolina Department of Health and Environmental Control (SC DHEC), in conjunction with the Centers for Disease Control and Prevention (CDC), is providing this information regarding the clinical presentation of ricin toxin.

There has been no evidence of human exposure to ricin in South Carolina. Health assessments, conducted by both district and central office public health personnel have reported no illnesses associated with the events in Greenville.

The following clinical information pertaining to Ricin poisoning is the **current information available**. Updated information as it becomes available, can be found at both on the DHEC (www.scdhec.gov) and the CDC (www.cdc.gov) websites.

Summary statement

Ricin is a potent biological toxin that is derived from castor beans. Its mechanism of action is inhibition of protein synthesis. Clinical manifestations are dependent on the route of exposure. Ingestion of ricin typically leads to profuse vomiting and diarrhea followed by multisystem organ failure and possibly death within 36 – 72 hours of exposure. Inhalation of ricin typically leads to respiratory distress, fever, and cough followed by the development of pulmonary edema, hypotension, respiratory failure and possibly death within 36 – 72 hours.

The amount and route of the exposure to ricin and the premorbid condition of the person exposed will contribute to the time of onset and the severity of illness. For example, the inhalation of ricin would be expected to lead to a quicker onset of poisoning and to cause a more rapid progression of poisoning when compared to the ingestion of ricin, given the same exposure amount.

The following is a more comprehensive list of signs and symptoms that may be encountered in a person exposed to ricin. They do not convey prioritization or indicate specificity. Also, partial presentations (an absence of some of the following signs/symptoms) do not necessarily imply less severe disease.

Case classification

Probable: a clinically compatible case with a high index of suspicion (reliable intelligence or patient history) for ricin or abrin exposure or which is epidemiologically linked to a laboratory-confirmed case.

Confirmed: a clinically compatible case with laboratory confirmation

Clinical description

Ingestion of ricin (or abrin, a closely related toxin) typically leads to profuse vomiting and diarrhea, that may or may not be bloody, followed by hypovolemic shock and multi-system organ failure. Influenza-like symptoms of fever, myalgia, and arthralgia, and weakness may also be reported.

Differential diagnosis

Inhalation:

Staphylococcal enterotoxin B
Exposure to pyrolysis by-products of organofluorines (Teflon, Kevlar)
Oxides of nitrogen
Phosgene

Ingestion:

Enteric pathogens
Mushrooms
Caustics
Iron
Arsenic
Colchicine

Signs and Symptoms

Gastrointestinal signs and symptoms

- ♦ Abdominal pain
- ♦ Vomiting
- ♦ Diarrhea (nonbloody or bloody)
- ♦ Abnormal liver function tests
- ♦ Multiple ulcerations and hemorrhages of gastric and small-intestinal mucosa on endoscopy

Respiratory signs and symptoms (progression of illness may occur despite antibiotic therapy):

- ♦ Cough
- ♦ Chest tightness
- ♦ Dyspnea
- ♦ Hypoxemia
- ♦ Noncardiogenic pulmonary edema

Skin and mucous membranes:

- ♦ Redness and pain of eyes and skin

General signs and symptoms:

- ♦ Fever
- ♦ Fatigue
- ♦ Weakness
- ♦ Muscle pain
- ♦ Dehydration

Other organ involvement:

- Seizures (uncommon)
- Cardiovascular collapse (hypovolemic shock)

Laboratory (nonspecific)

- Metabolic acidosis
- Increased liver function tests
- Increased renal function tests
- Hematuria
- Leukocytosis (2 to 5-fold higher than normal value)

Note: The actual clinical manifestations of a ricin exposure may be more variable than the syndrome described above.

Laboratory criteria for diagnosis

- ♦ Detection of ricin or abrin in urine or plasma OR
- ♦ Detection of ricin or abrin in environmental samples

Reporting

Physicians and health care facilities should be report suspected cases of exposure to ricin to your county health department or to the DHEC Bureau of Disease Control in Columbia (803-898-0861)

District/County Health Department phone numbers:

Any inquiries regarding the criminal investigation should be addressed to the FBI Office in Columbia (803-551-4200).

Internet Resources

S. C. Department of Health & Environmental Control <http://www.scdhec.net/hs/han/index.htm>

Centers for Disease Control <http://www.bt.cdc.gov/>

Statewide Urgently Reportable Conditions and Consultation number (24hr/7day): 1-888-847-0902

References

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3. US Medical Research Institute of Infectious Diseases: Medical Management of Biocausalities Handbook. 1998.
4. Franz DR, Jaax NK: Ricin Toxin. In: Textbook of Military Medicine. 1997:631-42.